

WHAT IS CLAIMED IS:

1 1. A method of operating in a CSMA network comprising:
2 exchanging messages by a device with a second device over a medium using a CSMA
3 contention-oriented service to establish a session of periodic contention-free intervals within the
4 CSMA contention-oriented service for use by the device and second device for contention-free
5 traffic on the medium; and

6 determining by the device when transmissions can occur on the medium during the
7 contention-free intervals based on the exchanged messages.

1 2. The method of claim 1, wherein the device is a master device and the second device is a
2 slave device.

1 3. The method of claim 2, wherein the contention-free traffic comprises down-stream
2 frames by the master device and up-stream frames by the slave device, and wherein determining
3 comprises:

4 polling by the master device of the slave device in the down-stream frames and receiving
5 upstream frames from the slave in response thereto.

1 4. The method of claim 1, wherein the device and the second device each includes a MAC
2 unit coupled to a host, further comprising:

3 responsive to the connection control messages exchange, receiving a set connection
4 message from the host at the MAC unit, the set connection message including a connection
5 number assigned to a connection between the device and the second device, a master flag for
6 indicating if the device is the master device and a control flag for indicating that master control is
7 to be passed and the direction in which the master control is to be passed.

1 5. The method of claim 4, wherein each frame in the contention-free traffic includes a
2 contention control indicator for indicating contention free status, a priority field including a
3 priority of the frame, a connection number field for identifying the connection number received
4 in the set connection message, as well as source and destination address fields.

1 6. The method of claim 5, wherein each frame includes frame control information
2 observable by substantially all devices in the CSMA network, and wherein the contention control
3 indicator and the priority are included in the frame control information.

1 7. The method of claim 5, wherein the device is a master device and the second device is a
2 slave device, and wherein the contention-free traffic includes a downstream frame from the
3 ~~master device and an upstream frame from the slave device.~~

1 8. The method of claim 7, wherein the downstream frame triggers transmission of an
2 upstream frame from the slave if the connection number matches the connection number in the
3 set connection message, the contention control indicator is set to indicate contention-free status,
4 the priority field is set to a highest priority and the source address matches the address of the
5 master device.

1 9. The method of claim 8, further comprising:
2 preventing transmission of an upstream frame following the downstream frame by setting
3 the connection number to a number other than the assigned connection number.

1 10. The method of claim 9, further comprising:
2 sending another downstream frame following the downstream.

1 11. The method of claim 7, wherein the set connection message further includes a source
2 address frame size specifying the size of the frame to be delivered, further comprising:
3 using a transmit timer based on the source address frame size to determine when a
4 queued frame is to be transmitted when no frame is received by the master device from the slave
5 device due to a failure of an upstream frame or downstream frame.

1 12. The method of claim 4, wherein the set connection message further includes a transmit
2 frame size specifying an average frame size, further comprising:

3 using the transmit frame size to determine the size of a dummy frame to be transmitted
4 when transmission of a frame is to occur and a frame is not queued for transmission.

1 13. The method of claim 4, wherein the device is a slave device and the second device is a
2 master device and the contention-free traffic includes a downstream frame by the master device
3 and an upstream frame by the slave device, and wherein the set connection message further
4 includes a lifetime timer value for indicating when a queued frame is to be discarded when the
5 downstream frame has not been received from the master device.

1 14. The method of claim 4, wherein the device is a master device, further comprising:
2 passing master control from the master device to the second device when the master flag
3 and the control flag are set.

1 15. The method of claim 4, wherein the second device is a master, further comprising:
2 receiving master control from the master device when the master flag and the control flag are set.

1 16. The method of claim 5, wherein the device is a slave device and wherein the connection
2 control messages indicate that the slave device is to transmit the last frame in the contention-free
3 interval, further comprising:
4 responsive to the exchange and triggered to transmit by a downstream frame, transmitting
5 an upstream frame with the contention control indicator having a value for indicating that the
6 contention-free interval is terminated.

1 17. The method of claim 1, wherein the medium is a power line.

1 18. The method of claim 14, wherein the master device and the second device to whom the
2 master control is passed have different network encryption keys and wherein passing comprises:
3 passing the master control in an unencrypted downstream frame during one of the contention-
4 free intervals.

19. The method of claim 1, wherein the device is a master device, further comprising:
exchanging messages between the device and a device in a different logical network for
arranging to pass control of the session to the device in the different logical network.

20. The method of claim 1, wherein frames in the contention-free traffic include frame control information that is heard by other devices and a payload that is not likely to be heard by the other devices.

21. The method of claim 20, wherein the frame control information includes a channel map index associated with channel map information to be applied to the payload for decoding and demodulation.

22. A computer program residing on a computer-readable medium for operating in a CSMA network, the computer program comprising instructions causing a computer to:

exchange messages by a device with a second device over a medium using a CSMA contention-oriented service to establish a session of periodic contention-free intervals within the CSMA contention-oriented service for use by the device and second device for contention-free traffic on the medium; and

determine by the device when transmissions can occur on the medium during the contention-free intervals based on the exchanged messages..